

A NEW GENUS OF TREMATODE (DIGENEA; GORGODERIDAE)
FROM THE URETER OF TUNA FISH (*THUNNUS*
THYNNUS MACCOYII) IN AUSTRALIA*

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SUMMARY

A large, digenetic trematode is described from the ureter of the tuna *Thunnus thynnus maccoyii* from southern Australian waters. It represents a new genus and species, *Cetiotrema crassum* (subfam. Gorgoderinae) distinguished by the size and shape of the body, the caeca being distant from the sides of the body, the uterus being inter-caecal, the vitellaria arising as three claviform lobes on each side and the seminal vesicle at least partly anterior to the genital pore.

The genus is close to *Phyllodistomum* Braun; *P. carangi* Manter, 1947, is considered to belong to *Cetiotrema*; *P. lancea* Mamaev, 1968 is very similar to *Cetiotrema crassum* in some features but, largely on account of the form of the vitellaria, is retained in *Phyllodistomum*.

The trematodes described below were sent to me by L. Madeline Angel, of the University of Adelaide, South Australia. They were collected by the Commonwealth Scientific & Industrial Research Organization (C.S.I.R.O.) from East Bass Strait and Kangaroo Island in 1939. Two specimens were collected from each of two tuna fish. The three complete and one incomplete specimens are remarkable for their large size. To the naked eye they suggested in size and shape such trematodes as *Fasciolopsis buski* but were even more muscular.

Each specimen was sharply bent ventrally near midbody and evidently strongly contracted. It was necessary to unfold (or cut) and then compress the specimens before they could be mounted on a slide and studied. After staining in Delafield's haematoxylin, each specimen was clamped between two slides, using brass clamps with screws to compress the slides tightly together, then passed through the alcohols to 100% before releasing. Compression of living specimens at the time of killing is preferred handling, but no important distortion seems to result from considerable mechanical pressure after preservation. However, only limited flattening can be achieved in this way.

The large size of these worms indicates they must bend or curl within the ureter of their host and their mass is such that some injury to the tuna must result. No information on incidence or intensity of infection is available.

Most parasites of such large size, especially when infecting a host of economic importance, are described in early literature. The location in the ureter, an organ often not examined for parasites, may explain why this genus seems to be undescribed.

FAMILY GORGODERIDAE

Cetiotrema crassum gen. nov., sp. nov.

(Figures 1-3)

Host: *Thunnus thynnus maccoyii* (Castelnau); Thunnidae; southern bluefin tuna.

Localities: East Bass Strait and Kangaroo Island, South Australia.

Collected by: C.S.I.R.O.; 1939.

Number: 4 (one incomplete); 2 from 1 host in each locality.

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Holotype: South Australian Museum, No. E863.

Paratype: U.S. National Museum, Helminth. Coll. No. 71424.

Description (Measurements on 3 specimens, all somewhat contracted and compressed after preservation. Measurements are in mm unless otherwise indicated): Body very large, thick, muscular, with almost parallel sides, broadly rounded at each end. Length 20.0 to 25.5; width 7.5 to 8.5. Sides of body thin and slightly thrown into short folds. Dorsal surface smooth; ventral surface, where not eroded, covered with minute papillae. Strong longitudinal muscles in parenchyma except near sides of body.

Oral sucker ventral, subterminal, circular, 1.2 to 1.5 wide. Forebody 2.755 to 3.8 long. Acetabulum circular, with circular aperture and longitudinal cavity; 1.235 to 1.615 wide. Sucker ratio 1:1.

Pharynx lacking, but anterior portion of oesophagus thick-walled. Oesophagus (contracted) about 0.348 to 0.536 long; bifurcation slightly nearer oral sucker than to acetabulum. Caeca extending to within 2.185 to 2.7 of posterior end of body; not far apart; dividing body width into approximate thirds.

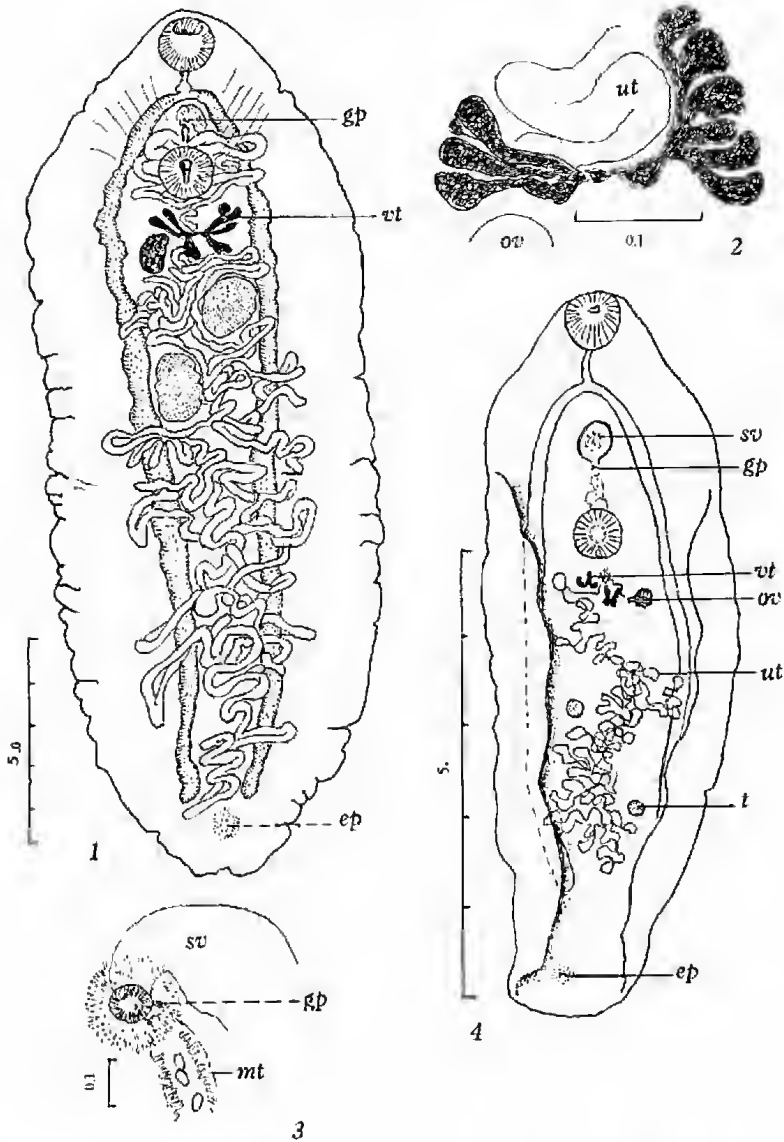
Genital pore median, about midway between acetabulum and bifurcation of oesophagus. Testes a little anterior to midbody, ovoid, smooth or slightly crenulated, diagonal, intercaecal, separated by short space; 1.52 to 2.28 long by 1.14 to 2.09 wide. Seminal vesicle a rounded to elongate sac, inconspicuous, between acetabulum and bifurcation of oesophagus, partly anterior to genital pore; cirrus sac and cirrus absent; prostatic duct short, surrounded by small, radially arranged prostatic cells, antero-dorsal to genital pore.

Ovary ovoid, smooth, to right of midline, pretesticular, separated from anterior testis by uterine coils. Vitellaria immediately anterior and to left of ovary; intercaecal; consisting of claviform lobes, three on each side, sometimes branching. Seminal receptacle lacking. Uterine coils narrow, extending to ends of caeca or slightly beyond; mostly intercaecal but frequently slightly lateral to caeca ventrally; extending between testes, between anterior testis and ovary, and lateral to acetabulum on both sides. Metraterm glandular or at least lined with cells, longitudinal, between genital pore and acetabulum. Eggs 38 to 45 by 20 to 29 microns; operculum apparently lacking; embryo only partially developed.

Excretory pore conspicuous, dorsal, glandular, 1.140 to 1.158 anterior to posterior end of body. Excretory vesicle not seen.

Discussion: Distinctive characters of *Cetiotrema* are large body size; broadly rounded ends; thick body but with thin sides; caeca distant from sides of body which are largely unoccupied by organs; chiefly intercaecal uterus; vitellaria consisting of claviform lobes arising as three on each side; and seminal vesicle at least partly anterior to genital pore. Other Gorgoderinac are generally much smaller.

The genus *Phyllodistomum* Braun, 1899 contains many species occurring in the urinary bladder of both marine and freshwater fishes. These species are thin-bodied and usually have a length of one to a few millimeters. It is, however, the nearest related genus to *Cetiotrema*, and one species, *P. carangis* Manter, 1947 (Fig. 4), 8 mm in length, from *Caranx ruber* (Bloch) in the Gulf of Mexico, can be considered a second species of *Cetiotrema*. It differs from *C. crassum* in smaller size and other characters but agrees in broadly rounded ends; caeca distant from sides of body; vitellaria consisting of three elongate lobes; papillae on the ventral surface; narrow, intercaecal uterine coils, and seminal vesicle anterior to the genital pore. It is from a pelagic fish. Although found in the body cavity, it probably was from the urinary bladder. *Phyllodistomum carangis* was compared with *P. acceptum* Looss, 1901, from the urinary bladder of *Crenilabrus* spp. in the Mediterranean. *Phyllodistomum acceptum* does seem to have somewhat similar



Figs. 1-3. *Cetriotrema crassum*. Fig. 1: Holotype. Ventral view. Fig. 2: Vitellaria of a paratype. Ventral view. Fig. 3: Terminal genital ducts. Ventral view. Fig. 4: *Cetriotrema carangis* (Manter, 1947). Dorsal view. (From Manter, 1947).

All figures were drawn with the aid of a camera lucida. The scale is in mm. Abbreviations: ep, excretory pore; gp, genital pore; mt, metraterm; ov, ovary; sv, seminal vesicle; t, testis; ut, uterus; vt, vitellaria.

vitellaria but the body is more tapered, the caeca nearer the sides of the body, the seminal vesicle posterior to the genital pore, and the uterine coils extend nearly to the sides of the body. Considering these characters together with the host, *P. acceptum* seems to be closely related to *P. (Vitekkarinus) crenilabris* Dolgikh & Naidjenova, 1968 from the Black Sea.

Mamaev (1968) has described a species, *Phyllodistomum lancea*, from the kidney of *Euthynnus affinis* and *Auxis thaazard* in the South China Sea. It is related to *C. crassum* and perhaps should be considered a third species of *Cetiotrema*. It does not appear to have a wide body with rounded ends but its figure shows longitudinal lines suggesting that the sides of the body may be folded inward ventrally. Its seminal vesicle is entirely anterior to the genital pore. However, the vitellaria are rather compact, lobed, grape-like masses rather than elongate tubes, and chiefly on that basis the species is retained for the present in the genus *Phyllodistomum*. It is about the same size as *C. carangis*.

Generic Diagnosis of Cetiotrema: Gorgoderidae, Gorgoderinae. Body large, with almost parallel sides and rounded ends; sides of body thin but rest of body may be highly muscular. Minute papillae on ventral surface. Suckers equal or subequal in size. Testes ovoid, diagonal, intercaecal; cirrus and cirrus sac lacking; seminal vesicle at least partly anterior to genital pore. Ovary pretesticular, to right of midline; seminal receptacle lacking. Vitellaria of three claviform lobes on each side, sometimes branching at ends; preovarian. Uterus of narrow coils, mostly or entirely intercaecal. Eggs non-operculate; embryos partly developed. Excretory pore dorsal, well anterior to posterior end of body. Parasitic in the urinary bladder or ureters of pelagic marine fishes. Type species: *Cetiotrema crassum*. Other species: *Cetiotrema carangis* (Manter, 1947) n. comb.

The name *Cetiotrema* is from *cetio* = monstrous or large; and *trema*, for trematode. The name *crassum* is from *crassus* = thick, referring to the thick, muscular body of that species.

Known life cycles of Gorgoderidae are as yet limited to freshwater species, but those of marine species are probably similar. The molluscan host is a bivalve mollusc; cystocercous cercariae develop in daughter sporocysts, emerge, and are ingested by a second intermediate host which, in different species, may be a variety of animals: insect larvae, crustaceans, snails, or tadpoles. In one species, *Phyllodistomum simile* Nybelin, 1926, precocious metacercariae in sporocysts are infective to the final host. Life cycles of marine species probably involve bivalve molluscs and Crustacea.

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